

High density distributions of victims of inland earthquakes in the vicinity of the faults

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The main shock of the Kumamoto earthquake M7.3 at 1 AM, 25 minutes of 16th, June, 2016 was generated by right strike slip of the Futagawa fault which runs from the western edge of Aso Caldera to Uto city. On two days before the main shock, in the evening of 14th July, an fore shock (M6.3) occurred on the same fault as the main shock, and nine people were killed. Caused by the main shock, 41 people were killed, and 37 people were killed in their own house. The square-street name of the houses of those victims were reported on the local newspaper “Kumakoto-Nichinichi Shinbun” up to 25th June. The present author obtained those papers up to three weeks after the main shock, and collected the articles of the victims, and the distribution of the houses of victims was clarified (Fig. 1). It is presumable that the occurrence time of the main shock was midnight, 1 o’ clock 25 minutes, so, almost all victims kept sleeping in their own houses. Fig shows that almost all victims were killed in the zone within 3 kilometers north side of the fault. On the other hand the distribution of entirely destroyed houses, about 8000 houses in total, is extends more widely. It should be noticed that the distribution of victims was sharply concentrated at the fault more than that of house damage. Images of traffic monitoring cameras show that, in the area close to the fault, the necessary time to a house to be entirely collapsed was only two to three second. It is considerable that only such a short time it is impossible to make effective protection to keep life in the destroyed houses.

Fig 2 shows the distribution of the mortality ratio (= number of killed per population) of the 1927 Kita-Tango earthquake M7.3 with its generation faults Gomura and Yamada faults. In this case we can recognize that the victims were densely distributed in the zone close to those faults.

Fig. 3 shows the distribution of the mortality of villages around Iga-Ueno castle town, Mie Prefecture caused by the 1854 Ansei Iga-Ueno earthquake. Matsuda et al. (1982) proposed that this earthquake wae generated by the activity of the Kizugawa fault. For this case also we can recognize that the victims were densely distributed in an area close to the fault. The rule discovered in the present study is valid for estimation wich fault was moved in the occurrences for historical earthquakes.

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Keywords: The 2016 Kumamoto Earthquake, The 1927 North Tango Earthquake, The 1854 Iga Ueno Earthquake, motallity distribution, mortality distribution and fault lines

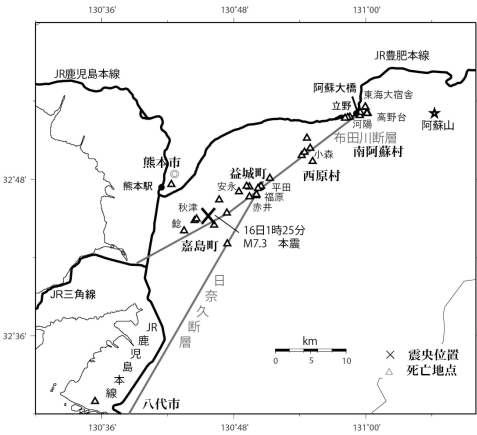


図1 2016年4月16日熊本地震の死者発生地点

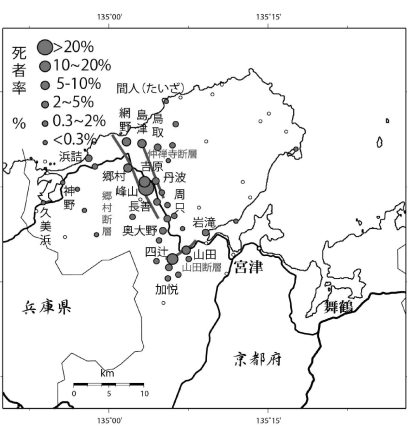


図2 1927年(昭和2年)北丹後地震の町村別死者率

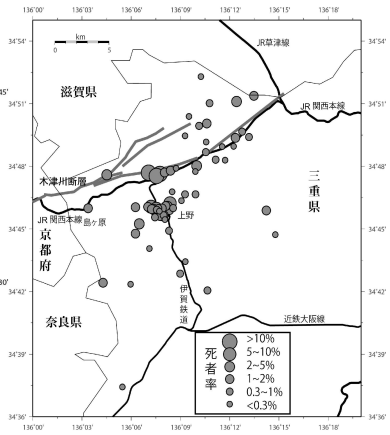


図3 安政元年(1854)6月15日伊賀上野地震の集落別死者率